

# **Regression of the Tethys Sea in central Asia during middle to late Eocene: Evidence from calcareous nannofossils of western Tarim Basin, NW China**

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Calcareous nannofossil assemblages from middle to upper Eocene sediments of the western Tarim Basin indicate two important episodes of marine incursion into the basin. The first episode represents a period of shallowing upward in the Wulagen Formation, and is dated as Zone CNE13 (Lutetian) by the co-occurrence of *Discoaster bifax*, *Chiasmolithus solitus*, and common *Reticulofenestra umbilicus*. The presence of a diverse assemblage of discoasters in the basal Wulagen suggests deposition occurred in oligotrophic, warm-water with a connection to the open ocean. Progressive shallowing over time led to the formation of a restricted basin in which only *Coccolithus pelagicus* could survive. The second major episode of marine incursion is preserved in the middle part of the Bashibulake Formation, which is dated as Zone CNE17 (Bartonian/Priabonian) based on the presence of common *Cribrocentrum erbae*. The interval between the two marine incursions was dominated by subaerial exposure and evaporation, resulting in the deposition of gypsum at the top of the Wulagen Formation. Although maximum regression at the end of the Lutetian is followed by sea-level rise at the beginning of the Bartonian globally, it is clear that local tectonics played a crucial role in regional marine incursions into the Tarim Basin during deposition of the Wulagen Formation.